

Claims

Having thus described the invention, the following is claimed:

1. A system for scanning a target, comprising:  
a light source providing a light beam;  
5 a reflector having an arcuate reflective surface with a variable shape;  
a shape controlling system for controlling said shape of said reflector; and  
a beam expander;

10 said reflector reflecting a first portion of said light beam from said light source onto said beam expander, said beam expander reflecting at least a second portion of said first portion of said light beam onto said target, and said shape controlling system selectively varying said shape of said reflector, whereby said second portion scans across at least a portion of said target.

2. The system of claim 1, further including a photo sensor, wherein said target reflects at least a portion of said second portion of light onto said photo sensor and said photo sensor generates an electrical signal representative of said at least a portion of said second portion of light.

3. The system of claim 1, wherein said reflector includes a piezoelectric material with an arcuate reflective surface.

4. The system of claim 1, wherein said shape of said reflector is generally radial.

5. The system of claim 1, wherein said shape controlling system provides a voltage signal to said piezoelectric material, and said shape of said reflector is varied according to said voltage signal.

6. The system of claim 5, wherein said shape of said reflector is generally radial.
7. The system of claim 6, wherein said beam expander has a generally cylindrical reflective outer surface.
8. The system of claim 6, wherein said beam expander has a generally spherical reflective outer surface.
9. The system of claim 6, wherein said beam expander includes a convex arcuate reflective surface.
10. The system of claim 1, wherein said beam expander includes a convex arcuate reflective surface.
11. The system of claim 1, wherein said beam expander has a generally cylindrical reflective outer surface.
12. The system of claim 6, further including a photo sensor, wherein said target reflects at least a portion of said second portion of light onto said photo sensor and said photo sensor generates an electrical signal representative of said at least a portion of said second portion of light.
13. The system of claim 12, further including a conversion and interface system receiving said electrical signal from said photo sensor and converting said electrical signal to a digital code.

14. The system of claim 2, further including a conversion and interface system receiving said electrical signal from said photo sensor and converting said electrical signal to a digital code.

15. A method of scanning a target, comprising the steps of:  
providing a reflector having an arcuate reflective surface with a variable shape;  
providing a beam expander;  
5 providing a light beam from a light source to said reflector;  
reflecting a first portion of said light beam off of said reflector and onto said beam expander;  
reflecting a second portion of said light beam off of said beam expander and onto said target; and  
10 varying said shape of said reflector, thereby scanning at least a portion of said target with said second portion of said light beam.

16. The method of claim 15, further including providing a control system with a control signal, wherein said shape of said reflector varies according to said control signal.

17. The method of claim 16, wherein said reflector includes a piezoelectric material having at least two electrodes, and said shape varies according to the voltage across said electrodes.

18. The method of claim 16, wherein said beam expander includes a convex arcuate reflective surface.

19. The method of claim 16, wherein said beam expander has a generally cylindrical reflective outer surface.

20. The method of claim 15, wherein said beam expander has a generally cylindrical reflective outer surface.

21. A target scanning apparatus, comprising:  
a housing having generally horizontal top and bottom sides, generally vertical left and right sides, said sides extending longitudinally between generally vertical front and rear ends;  
a scanning system mounted in said housing and having a reflector with a variable shape arcuate convex reflective surface, a light source providing a light beam to said reflector, and a control system adapted to control said shape of said reflector;  
a mirror displaced from said reflector in said housing near one of said front and rear ends; and  
an aperture in one of said sides near said one of said front and rear ends;  
said reflector reflecting a first portion of said light beam onto said mirror, and said mirror being oriented so as to reflect a second portion of said light beam from said reflector through said aperture and onto said target, and said control system varying the shape of said reflector whereby said second portion of said light beam scans at least a portion of said target.

22. The apparatus of claim 21, wherein said mirror has a convex arcuate reflective surface, whereby said light beam is expanded.

23. A system for scanning a target, comprising:  
means for providing a light beam;  
reflector means for reflecting a first portion of said light beam;  
expander means for reflecting a second portion of said light beam from said reflector  
means onto said target; and  
means for varying said shape of said reflector means, by which at least a portion of said target is scanned with said second portion of said light beam.